

JAPANESE UTILITY MODEL APPLICATION KOKAI NUMBER: S59-20273

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(54) SUPPORTING FRAME FOR DISPLAY ELEMENT

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JAPANESE UTILITY MODEL APPLICATION KOKAI NUMBER: S62-137479

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(54) Name of the Device: LIQUID CRYSTAL DISPLAY DEVICE

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## SPECIFICATION

### 1. Title of the Device

SUPPORTING FRAME FOR DISPLAY ELEMENT

### 2. Claims

1. A supporting frame for a display element which is characterized in that in a supporting frame that fastens and supports a display element on a board, elastic projections and adjustment screws are appropriately disposed facing each other on the inside walls of this supporting frame, and [this supporting frame] is devised so that the fastening and supporting position of the display element can be adjusted by the operation of the above-mentioned adjustment screws.

### 3. Detailed Description of the Device

#### <Field of Industrial Utilization>

The present device relates to a supporting frame that is suitable for use in electronic devices such as electronic desktop calculators, and more particularly relates to a supporting frame that fastens and supports a display element on a board.

#### <Prior Art>

In compact electronic devices such as electronic desktop calculators, a liquid crystal display element formed by sealing a liquid crystal between two glass plates is mounted on the printed wiring board of the device. In this case, the display element is fastened to the surface of the board by means of a fastening frame with an L-shaped cross section.

However, in the case of display elements [used] in recent years, the amount of display information has increased greatly as a result of the diversification of the functions of such devices. In order to handle this situation, the number of connection terminals has increased, and the pitch of these terminals has become extremely narrow. Consequently, there is a danger that the terminals of the display element will contact portions of the board other than the patterns to which the terminals are to be connected as a result of positional deviation during fastening. Accordingly, in cases where the above-mentioned conventional fastening and supporting frame is used, the following problem has been encountered in the fastening and supporting frame: namely, it is naturally necessary to improve the dimensional precision and assembly precision of the pitch between the respective terminals of the display element and the wiring pattern on the board.

<Problems That the Device is to Solve>

In light of such conventional problems, the present device provides a supporting frame for a display element in which adjustment screws and elastic projections are appropriately disposed facing each other inside a fastening and supporting frame, so that the above-mentioned element used for the display of large quantities of information can easily be mounted on a board without [any need to] increase the precision of the parts themselves or the precision during assembly.

<Embodiments>

Figure 1 is a horizontal sectional view of the display element supporting frame of the present device, and Figure 2 is a longitudinal sectional view of the same supporting frame.

This supporting frame 1 comprises a frame body that supports the periphery of a rectangular display element 2. The top part of this frame is bent inward so as to show an L-shaped cross section; meanwhile, pins are installed in an upright attitude at an appropriate spacing in the bottom part so that [the frame] can be attached to the board 4 by passing these pins through holes formed in this board 4 and crimping the pins.

Furthermore, screw holes 5 are formed in two adjacent wall surfaces of the supporting frame 1, and position-adjustment screws 6 are screwed through these screw holes 5. Meanwhile, two circular arc-form elastic projections 7 that protrude toward the inside of the frame are respectively disposed on each of the wall surfaces facing the above-mentioned wall surfaces, i.e., on each of the two wall surfaces that face the position-adjustment screws 6. These elastic projections 7 are integrally formed when the supporting frame 1 is formed by molding a resin; the height of these projections is set so that the projections face the position-adjustment screws 6 and the side walls of the display element 2 that is supported.

Furthermore, Figure 1 is a sectional view along line B-B' in Figure 2, and Figure 2 is a sectional view along line A-A' in Figure 1. Moreover, in cases where the above-mentioned supporting frame is formed from a metal, the elastic projections 7 may also be constructed from leaf springs or resin springs.

In such a construction, as is shown in Figure 2, if an anisotropic conductive rubber 8 is placed on the board 4, and the display element 2 is placed on top of this, after which this element is covered by the supporting frame 1, and the pins 3 are crimped, then the above-mentioned display element 2 can be fastened to and supported on the board 4.

In this case, furthermore, since the display element 2 is driven by the elastic projections 7 toward the wall surfaces in which the position-adjustment screws 6 are installed, the position of

the display element 2 can be appropriately adjusted in the X and Y directions in the figures using these two screws 6.

In this way, a certain amount of error in the supporting position during assembly or in the dimensional precision of the parts themselves can be simply corrected using the above-mentioned position-adjustment means.

**<Effect>**

As was described above, elastic projections and adjustment screws are appropriately disposed facing each other on the inside walls of the display element supporting frame of the present device. Accordingly, the fastening and supporting of the display element and the positioning of the display element can be simultaneously performed in a simple manner. Furthermore, since there is no need for strict dimensional precision in the display element, supporting frame or printed wiring board, [the supporting frame of the present device] can be provided very inexpensively.

**4. Brief Description of the Drawings**

Figure 1 is a horizontal sectional view of the supporting frame of the present device, and Figure 2 is a longitudinal sectional view of the same frame.

1 Supporting frame, 2 Display element, 3 Pins, 4 Board, 5 Screw holes, 6 Position-adjustment screws, 7 Elastic projections, 8 Anisotropic conductive rubber.

Agent: Yoshihiko Fukushi, Patent Attorney (and two others)

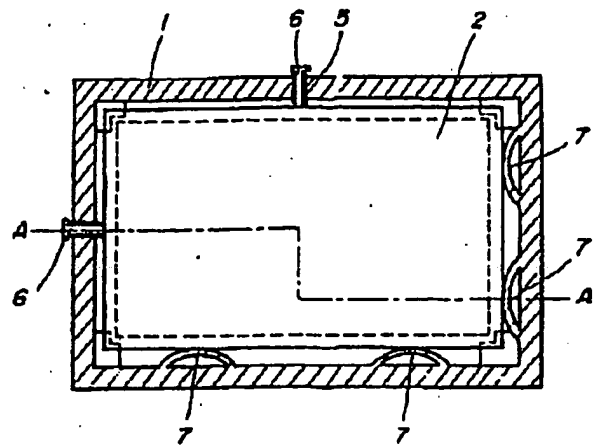


Figure 1

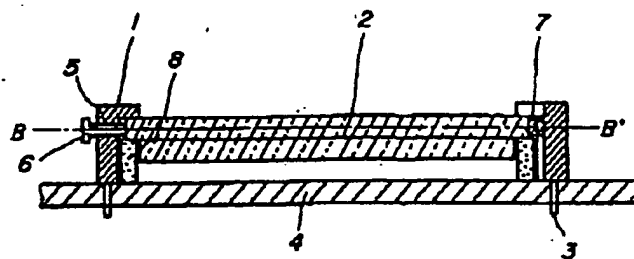


Figure 2

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⑨ 日本国特許庁 (JP)

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審査請求 未請求

(全 頁)

⑭ 表示素子の支持枠

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⑰ 出 願 昭57(1982)7月27日

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## 明 細 書

### 1. 考案の名称

表示素子の支持枠

### 2. 実用新案登録請求の範囲

1. 基板上に表示素子を固定支持する支持枠において、該支持枠の内壁に弾性突起と調整ネジを適宜対向配置し、前記調整ネジの操作で表示素子の固定支持位置を調整できるようにした事を特徴とする表示素子の支持枠。

### 8. 考案の詳細な説明

#### <産業上の利用分野>

本考案は電子式卓上計算機等の電子機器に供して好適な支持枠に関し、特に基板上に表示素子を固定支持する支持枠に関するものである。

#### <従来技術>

電子式卓上計算機等の小型電子機器では二枚のガラス板間に液晶を封入してなる液晶表示素子を機器のプリント配線基板上に搭載している。この場合、表示素子は断面し字状の固定枠にて基板上に枠止めされている。

(1)



しかしながら、最近の表示素子は機器の多機能化に伴ってその表示情報量が大幅に増大し、これに応えるために接続端子数が増すとともに端子のピッチが非常に狭くなっている関係上、固定時の位置ずれによって表示素子の端子が基板上の接続すべくパターン以外の部分に接触する虞れがあり、したがって上記従来の固定支持枠を使用する場合は固定支持枠は勿論表示素子の各端子間ピッチ及び基板上の配線パターンの寸法精度と組立精度を上げなければならないという問題があった。

#### ＜解決しようとする問題点＞

本考案はかかる従来の問題点に鑑み、固定支持枠内に調整ネジと弾性突起を適宜対向するよう配設し、これによって部品自体の精度及び組立時の精度を上げることなく上記多情報表示用素子の基板上への搭載を容易に行えるようにした表示素子の支持枠を提供するものである。

#### ＜実施例＞

第1図は本考案に係る表示素子の支持枠の水平方向断面図、第2図は同支持枠の縦断面図である。

(2)

この支持枠 1 は矩形状の表示素子 2 の周囲を支持する枠体から成り、その頂部は内側に折曲げられて断面し字状を呈し、一方底部には適当な間隔でピンが立設されていて、これを基板 4 の孔に嵌挿してカシメ止めすることにより該基板に取着できるようにになっている。

また支持枠 1 の隣接する 2 つの壁面にはネジ穴 5 が形成され且つこのネジ穴 5 には位置調整用ネジ 6 が螺挿されている。一方、前記壁面に対向する壁面、即ち位置調整用ネジ 6 に対向する二つの壁面にはそれぞれ枠の内側方向へ突出する円弧状の弾性突起 7 が二個ずつ設けられている。この弾性突起 7 は支持枠 1 を樹脂成型するとき一体的に設けられ、その高さは位置調整用ネジ 6 及び支持する表示素子 2 の側壁に対向するように決められている。

なお、第 1 図は第 2 図の B-B' 断面図、第 2 図は第 1 図の A-A' 断面図である。また、上記支持枠を金属で形成する場合は弾性突起 7 を板バネ、樹脂バネにて構成してもよい。



(3)

かかる構成によれば、第 2 図に示す通り基板 4 上に異方性導電ゴム 8 をのせ、その上に表示素子 2 を置き該素子に支持枠 1 をかぶせてピン 3 をカシメれば、該表示素子 2 を基板 4 上に固定支持することができる。

さらに、その際、表示素子 2 は弾性突起 7 により位置調整用ネジ 6 の設けている壁面方向へ附勢されているから、この二つのネジ 6 を用いて表示素子 2 の位置を適宜図中 X、Y 方向へ位置決めすることができる。

このようにして、組立時の支持位置や部品自体の寸法精度の多少の狂いは上記位置調整手段にて簡単に補正することができる。

#### < 効 果 >

叙上の様に、本考案の表示素子の支持枠は枠の内壁に弾性突起と調整ネジを適宜対向配置してなるから、表示素子の固定支持と位置合せを同時に且つ簡単に行え、しかも表示素子、支持枠、プリント配線基板に対して厳しい寸法精度を要求する必要がないので非常に安価に提供することができる。

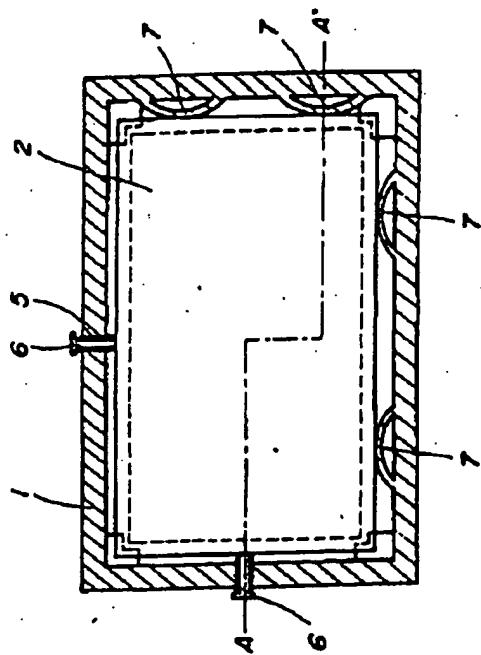
る。

#### 4. 図面の簡単な説明

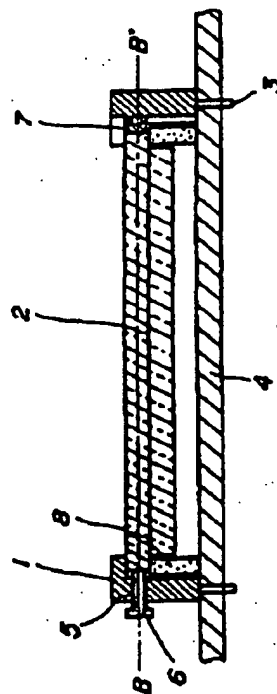
第1図は本考案に係る支持枠の水平方向断面図、  
第2図は同枠の縦断面図である。

1は支持枠、2は表示素子、3はピン、4は基板、5はネジ穴、6は位置調整用ネジ、7は弾性突起、8は異方性導電ゴム。

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第 1 図



第 2 図

741  
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